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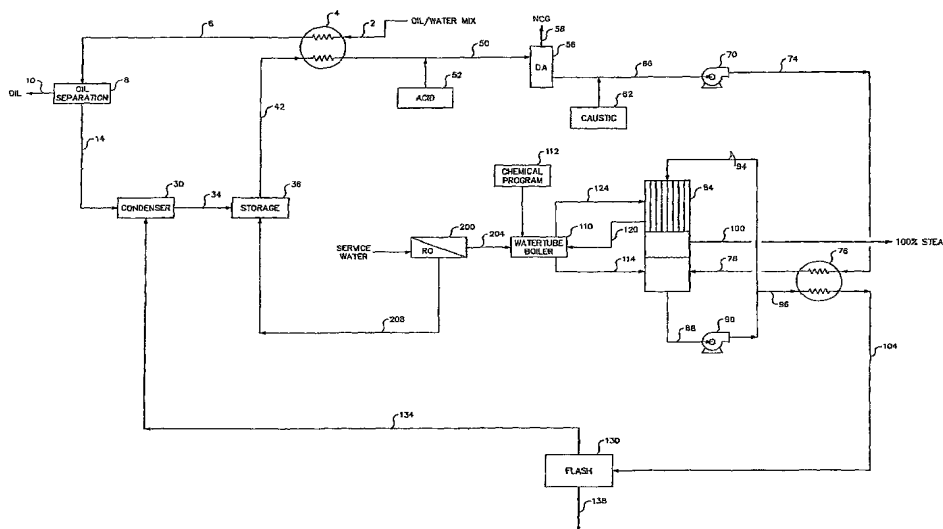
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[Continued on next page]

(54) Title: METHOD FOR PRODUCTION OF HIGH PRESSURE STEAM FROM PRODUCED WATER



(57) Abstract: An evaporation based method for generation of high pressure steam from produced water in the heavy oil production industry. De-oiled produced water is processed through a high pH/high pressure evaporator (84) driven by a commercial watertube boiler (110). The vapor produced by the evaporator is suitable for the steam assisted gravity drainage (SAGD) method being utilized by heavy oil recovery installations, without the use of once through steam generators that require extensive chemical treatment, and without requiring atmospheric distillation, which requires high power consuming compressors. Evaporator blowdown may be further treated in a crystallizing evaporator to provide a zero liquid discharge (ZLD) system and, with most produced waters, at least 98% of the incoming produced water stream can be recovered in the form of high pressure steam.

WO 2005/054746 A3



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